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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

OCT 23 1990

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CERTIFIED MAIL
RETURN RECEIPT REQUESTED

REF: 4WD-SSRB

James C. Brown
Manager, Environmental Affairs
Department
Post Office Box 248
Lower River Road
Charleston, Tennessee 37310

RE: Olin Corp/McIntosh Plant Superfund Site
McIntosh, Alabama

This office has reviewed the Remedial Investigation/Risk Assessment Report (RI/RA) as required by the Administrative Order by Consent (AOC) entered on May 8, 1990. Please find enclosed general and specific comments on this submittal. These comments will hopefully aid you in preparation of the Work Plan, Sampling and Analysis Plan, and Health and Safety Plan.

These documents were useful for scoping of the site. However, there are still concerns regarding the extent of contamination, etc. in several areas, including the main plant area. Therefore, EPA has determined that additional sampling is needed in both Operable Unit 1 and Operable Unit 2 (groundwater, soils and sediments). Because additional information is needed to verify historical data, EPA has determined that these documents do not meet a task as identified in the Scope of Work. The information does identify that a more extensive investigation of the entire site area is needed.

The AOC requires submittal of the Work Plan and associated documents within 45 days of receipt of these comments. Therefore, these documents are due in this office on or before December 12, 1990.

If there are any questions regarding the enclosed information, please feel free to contact me at (404)347-2643.

Sincerely,

Cheryl W. Smith
Remedial Project Manager

Enclosure

cc: Joe Downey, ADEM (w/out enclosure)
William J. Derocher (w/ enclosure)
Olin, Plant Manager

GENERAL COMMENTS

Olin Corp./McIntosh Plant
McIntosh, Alabama

1. In general, the report contained much redundancy and data that added little to the report. For example, details of the engineering properties of the soils were presented, although they were not related to the site problems. There is a lack of consistency in presentation of data included between similar sections. For example, closure details for some units extend for pages; others for paragraphs. There is a wealth of data in this report, but the manner of presentation is sometimes confusing. A few summary tables and figures could have replaced much of the dialogue.

2. There was no reference section, although the report contained numerous references throughout. The supporting documents were not consistently referenced throughout the document. A reference section needs to be added.

3. The reported number of closed sites and wells did not agree from section to section.

4. Because of the size of the report and appendices, summaries of data from the appendices should be added to the body of the report. A table showing analytical data by well and sampling episode to show changing conditions over the years would be extremely useful.

5. The Remedial Investigation Report (RI) focuses on the RCRA Solid Waste Management Units (SWMUs) as areas containing contaminated soils. The RI should justify whether these are the only areas where soil contamination exists, since the soil study conducted in 1982 was limited.

   In addition, a third contaminant source, of unknown origin appears to be located approximately 2300 feet west of the CPC plant location. This source along with the closed brine pond and CPC plant continue to contribute contaminants to the Quaternary aquifer. No attempt has been made by Olin to minimize the contribution of contaminants from the unknown source. Nor has there been any attention given to the low pH soils which are known to exist within 30 feet of the CPC landfill. The observation made that low pH soils facilitate chemical reations within clay that liberate metallic ions is true. Therefore, the potential for migration of metal ions from the surface to the Quaternary aquifer is enhanced within this area. Complete characterization of the nature and extent of contamination is required for this source of contamination.

6. The data base used in the Risk Assessment (RA) for surface water and sediments is extremely limited, and is inadequate for decision-making purposes. These data were collected during a single sampling round in 1987. Conditions in the sediments have most likely changed since that time so that these data may

not be representative or useful for identifying current or future risks. The entire area must be evaluated (basin and associated wetlands).

Toxicity testing should be conducted with basin sediment samples utilizing standard test organisms. At a minimum, a biotic survey of the wetlands should be conducted on benthic organisms and birds to establish structure and diversity.

A fish survey should be conducted in the basin on Olin property and the adjacent Tombigbee River for comparison. Fish species, size, general health appearance and fish tissue analysis to determine if bioaccumulation of mercury has occurred are essential data needed to establish extent of ecological degradation.

7. The rationale for selecting and eliminating exposure pathways is incomplete. For example, the groundwater pathway is eliminated since the Resource Conservation and Recovery Act (RCRA) corrective action program (CAP) prohibits contamination migration off site. However, personnel on site may be exposed to groundwater from the sampling of the wells, etc. This item is not clear and should be addressed.

8. Future use of the site should be discussed. The RI assumes the site will be maintained indefinitely by the Olin Corporation and no alternative future land use scenarios are discussed. These scenarios could include future residential, agricultural, or industrial uses.

9. The RA does not address acute exposures. The rationale provided does not address potential exposures to people who routinely access the site, such as security and maintenance personnel. Risk estimates for acute exposures should be developed or justification for not addressing these acute exposures should be added.

   The RA does not address subchronic exposures. A discussion on subchronic exposures should be included in the RA and risk estimates should be developed.

10. A trespass scenario should be considered since evidence exists that the basin is being utilized as a fishing area especially during high rainfall periods.

11. Groundwater exposures are discussed and disregarded in the RA, while acute exposures, subchronic exposures, and future land uses are not included in the discussion. Groundwater exposures should be reassessed with these exposures and future land use in mind. The discussion should include existing concentrations of contaminants (including chloroform), and the projected time frame for decreasing concentrations to equal to or below detection limits or levels of concern.

12. Movement of the mercury plume at the southeastern property boundary (near wells E1 and E2) is noted in the report. However, no information or data is provided to indicate if the plume movement has been arrested.

13. Contaminated soils are not characterized or considered in the RA. Exposure pathways are stated to be incomplete based on institutional controls. This matter should be further discussed and justified in a section on potential uses of the site.

14. The selection of "chemicals of concern" is based on very limited data that do not appear to be representative of current site conditions. The chemicals of concern should be re-evaluated in terms of representativeness.

15. The RI has concluded that the potential for air releases has been effectively eliminated due to the procedures used for closure of the SWMUs. The SWMUs are all located within the active plant area and does not include the basin area, which is the area evaluated by the RA. The air analysis for the RI needs to be expanded to include the basin area and should include the contribution of emissions from the 16 state and/or federal regulated air discharge sources from the plant process area since the plant is located adjacent to the basin area. Although these 16 sources are within the required permit limits, the risk resulting from air emissions should be evaluated by using the combined emissions from the two areas.

    The mercury concentration resulting from the two combined areas should not exceed the National Emission Standard for Hazardous Air Pollutants (NESHAP) for mercury, which is 2300 grams per 24-hour period. This NESHAP can be found in 40 CFR 61.52.

16. The data quality objectives for early studies are often questionable. Therefore, field investigations which are conducted in accordance with an approved Sampling and Analysis Plan which includes a site-specific Field Sampling and Analysis Plan and Quality Assurance/Quality Control Plan need to be conducted to verify historical data, and the extent of contamination.

TECHNICAL REVIEW AND SPECIFIC COMMENTS

Olin Corporation McIntosh Plant
McIntosh, Alabama

No.	Page	Section	Paragraph	Comments
1	1 2	ES	4 3	Inconsistency throughout document on total number of closed or clean-closed RCRA SWMUs. RI should include those SWMUs listed in AOC unless additional areas have been closed since execution of that document.
2	2	ES	2	Inconsistency between actual number of wells present on-site. Section 1.3.4 lists a total of 99 wells, whereas this section lists 118. Reconcile inconsistency.
3	3	ES	3	Define what is meant by "slightly exceeds USEPA guidelines..." on line 7. Identify guidelines utilized to make this statement.
4	1	1	1	Include location map identifying established coordinates (either topographical or longitudinal/latitudinal)
5	2	1	1	Does data base include analyses performed on basin area. If not, this should be corrected to correspond with "plant area only." A summarization of soil investigations completed at the site should also be included.
6	4	1	2	Identify actual acreage of main plant area.
7	4	1	2	Reference to figure that identifies the location of all site structures, including wetlands/basin area. If figure is not included in the later sections, prepare new figure and include.
8	4	1	3	Site the specific topographical map needed. Specifically, identify location of Bilbo Creek in reference to site location.

No.	Page	Section	Paragraph	Comments
9	5	1	2	Include a map showing the site relative to the physiographic providences.
10	7	1	Fig 1-2	Some areas of this figure are not legible. Provide a clearer copy in Work Plan and final RI report.
11	9	1	1	The terminology for some of the SWMUs does not correlate with Section 3.4 (i.e. Hex Storage Building and Hazardous Waste Drum storage). Please clarify.
12	9	1	3	Describe CAP treatment processes in more detail than presently presented.
13	10	1	4	Expound on CAP's ability to mitigate contaminants present in groundwater. Identify cleanup goals and time-frame for achieving these goals.
14	11	1	All	Because the Work Plan and subsequent RI report are stand alone documents, a summary of all past investigations is needed in these documents.
15	11	1	3	Include data that supports presence of clay aquiclude and the following statement regarding migration of contaminants from the Quaternary aquifer to the Miocene aquifer.
16	2	2	Fig. 2-1	Identify exact location of CPC Landfill and (2) sanitary landfills (only one found in figure). Identify location of (3) ash ponds (only 2 found in figure). Identify location of (2) lime ponds (only 1 shown in figure).
17	3	2	1	Summarization of information on current plant process areas, process flows, production capacities, material and energy consumption, and waste emissions and controls are needed.

No.	Page	Section	Paragraph	Comments
18	3	2	4	Provide information on volume and types of material placed in (2) sanitary landfills.
19	5	2	2	Title should be changed to inactive non-hazardous waste management units. These units do fall under the authority of RCRA. The HSWA Amendments gave EPA the authority under RCRA to require corrective action for releases from Solid Waste Management Units including those that do not meet the definition of a Hazardous Waste Management Unit.
20	5	2	3	Identify actual number of RCRA SWMUs. There is a discrepancy between this reference and number of units identified in Executive Summary.
21	5	2	3	The title of this section should be changed to "RCRA Regulated Units Closed under 40 CFR Part 265 (Interim Status)".
22	5	2	Fig. 2-1	Identify location of filter backwash pond which is not found in this figure.
23	6	2	2	The Weak Brine Pond is mentioned several times, but the strong Brine Pond, also shown closed and capped on several maps, is never discussed. Please explain.
24	6	2	4	Identify location of TCAN tank on Fig. 2-1.
25	8	2	Fig. 2-3	A site specific topographic map is needed since existing map lacks detail (due to large size).
26	11	2	2	Well construction specifications are included in Appendix B instead of Appendix A as stated on line 9.
27	11	2	2	Only able to locate 9 of the 12 wells identified in this reference in Fig. 2-4. Unable to locate WW-2, 3, and 5.

No.	Page	Section	Paragraph	Comments
28	14	2	Table 2-2	Data on WW-12 missing from this reference.
29	15	2	Table 2-3	Page 2-11 states that these wells were drilled from 1980 to 1981. This table shows only 1980 wells. In addition, PE1D and PE7 are found on Fig. 2-4, but not listed in this table. These discrepancies need to be explained or corrected. Explain why half of the wells have boring logs and half do not.
30	16	2	4	Construction details are needed for all wells (similar to information provided in this reference). This information should be incorporated into the body of the RI report instead of in an Appendix. In addition, construction details on existing wells presented in Appendix B are incomplete.
31	18	2	1	"k values" should be written as "K values", since "k" represents permeability of the medium and "K" represents Hydraulic Conductivity.
32	25	2	Table 2-9	Really informative table. Probably would be more beneficial if placed earlier in Section and replace other tables previously presented. Several wells listed in this table do not appear on Fig. 2-4 (BW8, BW9, MP10, WP6A, WP7A, WP9, PL-1, PL-2, the OB series, and OS-1). Please provide map that identifies location of all wells on site.
33	28	2	1	Since the results of the monitoring program are discussed here, the contour maps showing groundwater contours and isoconcentration maps should be included or their locations referenced.

No.	Page	Section	Paragraph	Comments
34	28	2	2	Data actually presented in Appendix B instead of Appendix C.
35	31	2	1	Data actually presented in Appendix B instead of Appendix C.
36	31	2	2	Statement made in last sentence untrue. Several deficiencies were noted during a subsequent RCRA Comprehensive Groundwater Monitoring Evaluation (CME). Among these deficiencies was the filtering of samples collected for metal analyses. None of the facility's groundwater records reflected that analyses were conducted on filtered samples. A comparison of ESD metals data against historical facility data indicated that with the exception of mercury, virtually all the reported historical metals data were probably reported low. Data for metals for which there are drinking water standards or other health-based criteria should be evaluated to determine if filtering has masked any potentially elevated occurrences which could be considered problems.
37	32	2	All	How does the foundation study data relate to the contamination problems at Olin? Were any cross sections prepared showing the stratigraphy or was the data used in any way other than construction?
38	34	2	3	A summarization of data collected during the S&ME (1982) study would be useful.
39	43	2	4	Bullet 1 - The fact that mercury was detected below the drinking water standard is not as relevant in the basin area as a comparison with the Ambient Water Quality Criteria (AWQC) for The Protection of Aquatic Life. This summary of the study fails to mention that all surface water samples containing detectable concentrations of mercury exceeded the AWQC for chronic toxicity to aquatic life. Also, since the

No.	Page	Section	Paragraph	Comments
				detection limit is approximately an order of magnitude greater than the AWQC, it is difficult to access how many samples from the basin area exceeded the AWQC. Bullet 2 - Stating that leachable mercury in the sediments is below the detection limit in all but one sample is not extremely useful since the detecting limit is 0.2 ug/l and the AWQC for aquatic life is 0.012 ug/l.
40	44	2	1	Several of the bulleted conclusions presented indicate that observed contamination in the basin area sediments is insignificant. Information contained in these bullets also indicates that local occurrences of certain compounds were "high". This was attributed to the non-homogeneous nature of the sample. This type of occurrence can also be defined as a "hot spot". A better explanation of this data is in order.
41	9	3	3	When was data collected regarding the location of domestic wells near the Site? Is this information current? Language describing location of wells is a little confusing. A map identifying these locations in relation to the site would clarify this matter. In addition, the map could also include businesses and residential areas in the vicinity of the site.
42	12	3	Fig. 3-4	A scale should be included on all maps.
43	14	3	3	The report states that Hg and pH levels were within acceptable limits. Please specify these limits and provide a summarization of data.
44	13	3	4	The title "RCRA Interim Status Surface Impoundment Units" should be changed to "RCRA Surface Impoundments closed under 40 CFR Part 265." Under

No.	Page	Section	Paragraph	Comments
				this section, all the units are subject to closure equivalency and therefore additional work is necessary to meet the equivalency determination.
45	15	3	2	What were the results of the EP toxicity test for the Brine Pond? Please provide data results and required limits.
46	15	3	5	Please explain if any monitoring wells were installed to monitor this unit (Filter Backwash Pond).
47	16	3	4	Fig. 3-4 shows the Strong Brine Pond closed, but it is not mentioned here or anywhere in this document. Please explain its current status.
48	18	3	4	Although Olin no longer needs financial assurance for closure of the Weak Brine Pond they are still required to have post-closure assurance for this unit. It seems the letters from Scarbrough and Cox may have been misinterpreted. Please clarify.
49	20	3	4	Fig. 3-4 identifies 2 ash ponds. This reference notes that 3 ponds exist. Please explain this discrepancy.
50	21	3	1	The cost of closure was included in all but this unit. Please explain if it is not available.
51	22	3	2	The TCAN unit does not appear on Fig. 3-4. Please explain why and state if there are any monitoring wells associated with this unit.
52	22/23	3	All	The PCB/Hexachlorobenzene Storage Building does not appear on Fig. 3-4. Please explain why and state if there are any monitoring wells associated with all these units.
53	24	3	1	Are diagrams of caps similar to Fig. 3-5 available?

No.	Page	Section	Paragraph	Comments
54	26	3	All	Please state if there are references available for this data.
55	26	3	3	Drainage ways do not flow, they carry liquids.
56	27	3	Fig. 3-6	The source of this information needs to be included on the map unless it is original work.
57	28	3	3	Acronyms should be defined when first mentioned; for example, CFS, MPN on p.3-33 and MGD on p. 3-35.
58	31	3	Fig. 3-7	The 100 year flood contour should be added to this figure.
59	36	3	4	A reference is needed for the 1976 water quality survey. In addition, more current data is needed.
60	37	3	Fig. 3-6	The table should indicate when the concentrations represent the detection limit. For example, cadmium, lead and mercury were only sampled once and the concentrations listed for each of these metals exceed the AWQC for aquatic life. However, it is not possible to tell from this table if these are positive detects or merely represent the detection limit for that chemical.
61	38	3	Fig. 3-9	A reference is needed for this figure.
62	39	3	Table 3-7	The surface water data on this table indicated that mercury levels in the Tombigbee River do not exceed the detection limit, upstream of the Olin discharge, but do exceed the detection limit in samples analyzed downstream of the discharge and in the discharge canal. These concentrations and the detection limit are greater than the AWQC for chronic aquatic toxicity. This surface water data indicate that the Tombigbee River is being impacted by the Olin facility. Sampling should be conducted during the basin investigation to define the level of impact the site has on the river.

No.	Page	Section	Paragraph	Comments
63	50	3	2	Aquifers do not flow under atmospheric pressure; groundwater does.
64	51	3	Fig. 3-13	Is scale consistent throughout entire diagram? In addition, a fence diagram would provide a more effective presentation.
65	54	3	5	Is the Miocene confining unit continuous across the entire site including the basin area or just under main plant? Please explain.
66	55	3	Fig. 3-14	Contour data from this map show high areas immediately west and south of the plant, and a low area to the southwest. Page 3-56, Paragraph 1 states the opposite. This discrepancy should be explained or corrected. Fig. 3-14 needs a north arrow.
67	57	3	2	Data provided in Fig. 3-14 should have an associated reference.
68	58	3	Fig. 3-15	Figure needs a north arrow.
69	62	3	Table 3-10	Change "UP-3" to "WP-3" and "Confirming" to "Confining".
70	63	3	3	Please provide current information including species associated with the site.
71	1	4	1	Does the statement "contaminant concentrations within the Miocene aquifer are actually below detection limits" mean that no compounds were detected or that compounds were identified in the samples, but were estimated at concentrations less than the method detection limit. Please clarify.
72	2	4	2	Figures (maps) showing precorrective contaminant concentrations and extent superimposed over present contaminant concentrations would be useful in determining if the corrective measures are as successful as stated.

No.	Page	Section	Paragraph	Comments
73	2	4	3	Please provide data supporting the statement "The distribution of contaminants in the quaternary alluvial aquifer...."
74	2	4	4	Are additional studies being planned to isolate the potential sources of mercury and chlorides discussed in this paragraph?
75	3	4	1	Are studies being conducted to confirm the postulation that chloroform is a degradation product of the compounds deposited in the landfill?
76	3	4	2	Are studies being planned to identify and characterize the suspected source area? In addition, does this area represent a contaminated soil area that should be investigated for remediation, risk assessment and feasibility study.
77	3	4	5	Olin states, "There are no current contributing sources of surface water or sediment contamination at the Olin plant." This cannot and should not be determined before certification of closure equivalency.
78	4	4	3	No references are given for the biota assay data. Please provide information on tests performed and resulting data. Sentences 4 and 5 beginning with "Sediment contamination..." are duplicates of sentences in subsection 4.1.3, Surface Water and Sediment. One can be eliminated.
79	4	4	4	There is reference to background samples at this point. Please identify location where samples were taken.
80	6	4	2&3	Please explain why samples were collected only to a depth of 5 to 8 feet when the extent of contamination, as defined by the portable G.C., obviously was not determined.

No.	Page	Section	Paragraph	Comments
81	17	4	3	Are studies being performed to confirm this conclusion? If so, please include in future documents.
82	18	4	1	A mud sample was analyzed at 0.0003 ug/l. Please identify for which constituent was analysis performed.
83	21	4	Table 4-5	Please explain what (1) and (2) represent.
84	22	4	All	The groundwater section should contain data tables which summarize all groundwater data. This information would assist in determining which wells are contaminated and which are not.
85	22	4	3	There are wells on all sides of the site (Fig. 4-9) that show concentrations of mercury at 0.1 ppb that would indicate more than periodic, localized increases. Please explain.
86	23-28	4	Fig. 4-9 thru 4-14	Please report depths for each location. Concentration data is not provided at all wells. Some wells screened in the shallow aquifer report concentrations on the deeper aquifer contour (WE-3, Fig. 4-10; MP-8, Fig. 4-14, and WP2A and BR7, Fig. 4-12). Some wells screened in the deeper aquifer report concentrations on the shallow aquifer contour map (PLS and PH7D, Fig. 7-9; PL4D and WP-3, Fig. 4-13, and PH3D and PL7S Fig. 4-11). These discrepancies need to be explained or corrected. The legends on Fig. 4-9 and Fig. 4-14 are not clear. All figures should identify site boundaries. Fig. 4-9 - This map needs a contour interval that is smaller and more indicative of the character of the plume.

No.	Page	Section	Paragraph	Comments
				Fig. 4-11 - There is an indication from review of this map that there is a source of chloride near BW3, PL4S and PL4D. This may be due to UIC brine wells. More investigation is needed to determine the source.
87	29	4	2	Additional investigation is needed to identify alternative source producing chloride contamination at the western Olin property line.
88	30	4	1	Please provide map identifying the location of wells DH1, DH2, and DH3 (penetrate Miocene Aquifer). A tabular summary comparing the data obtained from sampling events in 1982 and 1985 and in subsequent sampling period is needed. An explicit discussion of this tabular summary giving the logic behind any conclusions drawn, as well as the probabilities that other conclusions are valid should accompany this summary. Data for sampling performed during 1982 is not found in Appendix B.
89	30	4	2	If there is cross-contamination from drilling then the original wells and any future well should be double or triple cased. It is possible, because of the age of some of these wells that their integrity is not adequate and may need repair or replacement. All wells should be surveyed for integrity. Also, cross-contamination from well operations is just as serious as contamination from vertical seepage. In both events, contamination is introduced deeper into the aquifer. All precautions should be made to avoid or discontinue any cross-contamination.
90	31	4	1	The "relatively low concentrations" referenced here for g-HCCH (Lindane) exceed the AWQC for chronic aquatic toxicity (0.08 ppb) and the proposed MCL (0.2 ppb).

No.	Page	Section	Paragraph	Comments
91	31	4	2	Was mercury detected via a single sampling event or is the data from an average of a number of samples (Tombigbee River).
92	31	4	3	The basin surface water mercury concentrations should be compared with AWQC rather than MCL.
93	31	4	4	Were replicate samples taken at the same time as the first round of samples? If not, please identify date of sampling. Please explain rationale for taking 10 samples during first round of sampling and only taking 7 replicate samples .
94	32	4	All	Are there currently any periodic tests made of air quality across the site? If so, please provide data.
95	1	5	1	This section indicates that organic contaminants, other than hexachlorobenzene, were detected at low concentration in groundwater and sediment. ATSDR should evaluate these compounds and their concentration for risk assessment purposes. Many organic compounds have extremely low levels of concern.
96	1	5	2	Basin surface water mercury concentrations should be compared with AWQC rather than MCL. Please explain the basis for the statement that both mercury and hexachlorobenzene appear to be bound to the organics in the sediment. Last sentence - Discuss the conditions that have changed and affected mobility. A decrease in concentration is more likely the result of a decrease in source volume.

No.	Page	Section	Paragraph	Comments
97	4	5	2&3	Why is the discussion of the soil and vadose zone limited to the CPC area? Also, were the soils in this area analyzed for metals? Please explain if a comprehensive soil study for all contaminants being planned for the entire site.
98	4	5	3	Are the closed areas inspected periodically for leaking or soil contamination?
99	11	5	2	If the pumping rates had to be increased, are the systems designed to pump and treat larger water volumes?
100	12	5	4	Please explain if the model mentioned here is the same as USGS MIDFLOW (p.5-11). Upon what was the assumption of the Ciba-Geigy rate based?
101	13	5	3	Please explain the correlation between the actual pumping rates and the design rates.
102	15	5	1	Please explain why CA-3 and CA-5 effluents from the the carbon beds are routed through a separate pH adjustment system and the others are not.
103	15	5	2	Why is there no detection of mercury from discharge point 002? This outfall may need to be tested for mercury to confirm or deny its presence at this location.
104	17	5	All	For ease of review consistency, the concentration data should be reported in the same order as Section 4 (mercury, chloride, and total organics).
105	17	5	3	The organic concentrations in wells on the eastern side (PL-10D, PL9D, Figs. 4-14, 5-5) either remained essentially the same or increased between the time before the pumping began and the 1989 sampling (PL9D-0

No.	Page	Section	Paragraph	Comments
				in 1987, 4.8 in 1989), and the plume is larger. This does not support the decrease in contamination that the report claims. Please explain or correct.
106	21	5	2	The concentrations of mercury in wells on the eastern side (PL10D, PL9D and PL8D, Figs. 4-10, 5-7) have at least doubled between the time before the pumping began and this sampling event. The concentrations in the wells on the western and southern sides (WP4, WP2A, WP3, MP12 and PL7M, Figs. 4-10, 5-7) have more than doubled. The plume is considerably larger. This does not support the decrease in contamination that the report claims. Please explain or correct.
107	1	6	3	The final Baseline Risk Assessment should be prepared in accordance with current EPA guidance (EPA, 1989a; EPA, 1989b). The Superfund Public Health Manual is obsolete.
108	2	6	3	The exposure assessment does not discuss routes of entry, such as inhalation, ingestion, and dermal contact. A brief statement regarding routes of entry should be included.
109	2	6	5	The text states, "Risk Characterization: Quantitative estimations of the actual and potential hazards...." Risk characterization produces estimates of risks, not hazards. Therefore, the word "hazards" should be replaced by "risks."
110	3	6	2	The text discusses the use of animal models. However, it is not clear if the use of such models would cause an under-estimation or over-estimation of risk. A discussion on risk estimation uncertainty generated by the use of animal models should be included.

No.	Page	Section	Paragraph	Comments
111	3	6	4	The text states, "...these conservative assumptions act to remove the estimated risk from actual risk." This statement is not clear. The sentence should be reworded so the reader clearly understands that estimated risks developed under "worst case" assumptions are conservative, that is, are overestimated.
112	4	6	5	The exposure assessment does not consider routes of entry, such as inhalation, ingestion and dermal contact. Routes of entry should be included when discussing the exposure assessment.
113	5	6	3	While transport media, such as groundwater, soil, surface water, sediments and air, can be considered as sources of contamination, it is unclear whether these are considered primary or secondary sources because earlier sections do not include a conceptual site model. Therefore, this paragraph is confusing. It is recommended that the current EPA guidance (EPA, 1989a) be used to clarify this paragraph. In particular, refer to Chapter 6: Exposure Assessment.
114	6	6	3	The justification for eliminating the groundwater pathway is incomplete. Existing contamination, including chloroform, should be discussed. Document should therefore include a groundwater risk assessment which addresses the hypothetical situation of groundwater consumption of contaminant concentrations that are presently in the plume.
115	7	6	2	Although the Olin plant is fenced and patrolled 24 hours per day, soil exposure should not be disregarded when performing the RA since hazardous exposures may occur to

No.	Page	Section	Paragraph	Comments
				people who access the site routinely. Soil exposures should be examined for current and future uses under acute, subchronic, and chronic exposures, and risks should be estimated, if applicable. Also, the discussion on soils should address the potential of closed SWMUs contributing to groundwater contamination. This should be explained for clarity and completeness.
116	7	6	4	It is not clear why fishing would exclude swimming. Why is swimming not considered a likely activity in this Tombigbee River reach. This should be explained for clarity and completeness.
117	9	6	3	The selection of chemicals of concern was based on one sampling round performed during 1987. The information obtained will not adequately represent current basin conditions.
118	10	6	5	The text states, "...low concentrations of chlorobenzene present, ..." Actual values should be included and a reference should be made to the appropriate appendix. Actual values demonstrate attention to detail and thoroughness in the assessment.
119	12	6	7	The text states, "... Low levels of mercury are present in the Basin area." Actual values should be included and a reference should be made to the appropriate appendix. Actual values demonstrate attention to detail and thoroughness in the assessment.
120	15	6	3	The text states, "... there are insufficient data to characterize potential risks associated with this suspended sediment pathway." However, no further discussion regarding how the pathway will be

No.	Page	Section	Paragraph	Comments
				handled is provided. A discussion regarding whether this pathway will be further characterized or has been excluded from the quantitative analysis should be included. Exclusion of the pathway should be discussed with the RPM as required by current EPA guidance (EPA, 1989a).
121	17-19	6	All	The exposure point concentrations do not appear to be very reliable. They are based on extremely limited data that are not representative of current conditions. The exposure point concentrations should be re-evaluated in terms of representativeness.
122	18	6	2	The f_{OC} should be determined using analytical data, not assumed values.
123	19	6	5	The statement that acute exposures would not occur is incorrect, and subchronic exposures are not discussed. People who routinely access the site for security or maintenance purposes may experience acute and/or subchronic exposures. Acute and subchronic exposures should be included in the risk assessment.
124	20	6	1	The statement that the "... Integrated Risk Information System (IRIS) and other USEPA risk assessment data bases are not applicable for charaterization of acute exposure," is not sufficient justification to disregard acute exposures. This statement should be eliminated.
125	20	6	2	Calculations for CDI do not reflect projection over entire exposure period. Therefore, the calculations for the CDI for carcinogenic chemicals should be modified to reflect this. Also, the most probable and maximum scenarios differ only in the exposure point concentrations. These scenarios should also contain most probable and reasonable maximum exposure assumptions.

No.	Page	Section	Paragraph	Comments
26	20a	6	Table 6-7	The frequency of exposure assumption (2 days/year) for fish ingestion and surface water and sediment contact is low. The maximum scenario should incorporate a higher exposure frequency. The sediment ingestion rate should be 50 mg/day for an adult and 10 mg/day for a child. The dust adherence factor should be the EPA default value, of 1.45 mg/cm^2 contained in the Risk Assessment Guidance for Superfund Manual (EPA, 1989) unless a more site-specific sediment adherence factor can be provided. Be more specific in the reference for the max flux rate. Unable to locate this flux rate in SEAM. Several values are missing from the table and no explanation is provided with the table or in the text. A discussion should be included regarding the missing values and how they would impact the risk assessment.
127	20e	6	Table 6-9	The inhalation RfD for 1,2-Dichlorobenzene is 4×10^{-2} mg/kg/day. The reference for this chemical should be IRIS/HEAST*. The inhalation RfD for 1,4-dichlorobenzene should be 7×10^{-1} mg/kg/day. The reference for this chemical should be HEAST*. The inhalation CPF for hexachlorobenzene is 4.9×10^{-4} $mg/kg/day^{-1}$. The reference is HEAST*. The reference for pentachloronitrobenzene should be HEAST*.

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				The oral RfD for inorganic mercury is $3x10^{-4}$ mg/kg/day. The reference for alkyl mercury should be IRIS. (*HEAST-Health Effects Summary Tables (9/89)) The above changes should be incorporated into the risk calculations.
128	21	6	1	References for the chemicals of potential concern are not included in the text. The appropriate references should be included for clarity and completeness. If the information presented for each chemical was developed from the toxicity profiles provided in Appendix C, a statement to that effect should be included in this paragraph.
129	22	6	5	The acronym "CRAVE" is not defined. Acronyms should be defined on first reference.
130	23	6	All	Hazard indices and risks should be summed for the exposure to the same chemical by different pathways if the same individual is a potential receptor of the various exposure pathways.
131	24	6	3	It is not clear how mercury was determined to be the chemical primarily responsible for the hazard index exceeding 1. This should be explained for clarity.
132	25	6	2	The text states analysis by toxic effect was determined not to be necessary. However, it is not stated if the determination was reviewed by the Environmental Criteria and Assessment Office (ECAO) as required by current EPA guidance (EPA, 1989a). State whether the determination was reviewed by ECAO, and if so, the review results should be presented.

No.	Page	Section	Paragraph	Comments
132	25	6	4	The statement, "The carcinogenic potency factor, which is the upper 95 percent confidence limit...." is not correct. The carcinogenic potency factor is an upper 95th percentile confidence limit, that is, a specific value, not a range of values. The word "percentile" should replace "percent."
133	26	6	2	The text states, "A 95 percent upper-bound estimate is a hypothetical number which is calculated to give a value which has a 95 percent chance that it will be greater than the actual risk." This sentence is not clear since "it" may refer to the upper-bound estimate or estimated risks. Refer to the current EPA guidance (EPA, 1989a) and clarify this statement. In particular, see Section 8.2.
134	26	6	3	Although the current NCP sets the risks range to 10^{-6} to 10^{-4}, the point of departure for Superfund is 10^{-6}. For this reason, it should not be assumed that because a chemical exposure pathway produced a risk level which falls within this range, it is acceptable.
135	28	6	4	IRIS contains the same RfD for both inorganic and alkyl mercury.
136	29	6	All	This section indicated potential effects from mercury in the sediments. However, since the data base is extremely limited, and the modeling simplified, potential adverse effects cannot be identified. An aquatic indicator species should be chosen from the basin and samples should be collected and analyzed to determine if mercury is bioaccumulating.
137	40	6	2	EPA received analysis of tissue data performed at the site. However, this information was not included in this report. Please explain.

No.	Page	Section	Paragraph	Comments
138	1	7	Bullet 6	A hypothetical scenario for the consumption of groundwater in the contaminated plume, currently being remediated under RCRA Corrective Action Program, should be included in the risk assessment.
139	2	7	Section 7.1 Bullet 3	It is more appropriate to compare the mercury concentrations in the basin surface water with AWQC for aquatic toxicity than with human health drinking water standards.
140	1	C	3	The "Endangerment Assessment Handbook" is no longer used by EPA as guidance for developing risk assessments. The "Superfund Public Health Evaluation Manual" has been replaced by "Risk Assessment Guidance for Superfund (USEPA, 1989)."
141	4	C	3	The procedure for determining daily intake values discussed here is not reflected in the actual intake calculations. The chronic daily intake for carcinogens should be multiplied by years of exposure/years in a lifetime. For noncarcinogens, since the exposure is not averaged over a lifetime, the intake calculations are correct. This adjustment should be made in the intake calculations for carcinogenic chemicals.
142	11,12	C	All	Same as comment no. 130.